

Application Serial No.: 10/505,370



Docket No.: 255880US0PCT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF:

GROUP: 1796

Markus SCHERER, et al.

SERIAL NO: 10/505,370

EXAMINER: BERNSHTEYN

FILED: August 23, 2004

FOR: COPOLYMERS AS DEWAXING ADDITIVES

**DECLARATION UNDER 37 C.F.R. § 1.132**

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

Sir:

Now comes Dr. René Koschabek who deposes and states that:

1. I am a graduate in the field of chemistry and received my PhD degree in the year 2005.
2. I have been employed by Evonik RohMax Additives for 2.5 years as a Product Development Manager in the field of Lubricant- and Refinery-Additives.
3. The following experiments were carried out by me or under my direct supervision and control.

The data below show that the filtration volume per time is superior in the present invention compared to Mueller et al (US 5,098,550).

A filtration was performed with a 500 SN raffinate.

**The 500 SN raffinate:**

The raffinates that are fed into a dewaxing unit of a refinery are only the raw materials from which the lube oil base stocks like a 500 SN are obtained from. The raffinates are

therefore intermediates during the base stock production and have accordingly no commercial product designations. They come out of crude oil vacuum distillation units and are separated according to viscosity and boiling point specifications.

"SN" stands for solvent neutral.

The 500 SN have generally a kinematic viscosity at 40°C of ~100 cSt and at 100°C of ~11 cSt, a PP of less than -12°C. The boiling point is higher than 300°C.

#### **Experiments 1 and 2:**

In a first experiment, a 500 SN raffinate from an Italian refinery was used for the filtration together with the copolymer of behenyl acrylate and styrene designated as P1 in example 1 of the present application (see page 29, line 27 to page 30, line 8 of the specification). P1 contained 90w.-% behenyl acrylate and 10w.-% styrene; the polymer content of example 1 was 85 wt.-% and

In a second experiment, the same 500 SN raffinate was used together with the respective quantity of a 1:1-blend of polymers P1 and P2 of US 5,098,550.

P1 of US 5,098,550 was 100% poly behenyl acrylate; P2 was poly alkyl methacrylate with an average C-number within the alkyl-groups of 14; the degree of branching is 17.9%; the methacrylate was derived from a mixture of the alcohols Dobanol 25 of Shell AG and a C<sub>12</sub>-C<sub>18</sub> fatty alcohol; the polymer content of the 1:1-blend of P1 and P2 was 30 wt.-%.

**Experimental details:**

Experiment No. 1861

Date: 8/9/2009

Feedstock Name: Raffinate 500 SN (Italian Refinery)

Feedstock: Solvent=1:2.3

Initial sample weight: 70g

Treat Rate of the Dewaxing Aids: 344 ppm based on polymer

MBK 45%: Toluene 55%

Mixing temperature/Time: 80°C/15 min

**Cooling preparation**

Cooling bath temperature: 66°C to -23°C

Time (min): 62      Cooling rate: 1,4°C/min (average

Volume of solvent  
used for cleaning: 10ml

Coolant temperature: -18,0°C      Filter unit temperature: -18°C

Pressure/vacuum: 700mbar

Filtration

	Polymer P1 of the present application (Example 1)	Polymers P1:P2=1:1 of the Examples 1 and 2 of US 5098550
Time (sec)	Volume (ml)	Volume (ml)
5	4	4
10	9	7
15	13	9
20	16	11
25	18	13
30	20	15
35	22	16.5
40	24	18
45	25	19
50	27	20
55	29	21.5
60	31	22.5
65	32	24
70	33	25
75	34.5	26
80	36	27
85	37.5	28
90	38.5	29
100	41	31
110	43	32.5
120	46	34.5
130	48	36
140	50.5	38
150	53	40
160	55	41
170	57	42.5
180	59	44
190	61	46
200	63	47
240	65	53
270		57
300		61
360		66

Result:

The filtration time with the copolymer of behenyl acrylate and styrene (P1) of example 1 of the present application as dewaxing aid is one third faster compared to a 1:1-blend of polymers P1 and P2 of US 5,098,550.


It took 240 sec to filter 65 ml using polymer (P1) of the present case and 360 sec to filter 66 ml using a 1:1-blend of polymers P1 and P2 of US 5,098,550.

There is a significant advantage for the refineries when using the dewaxing aid of the present invention and is unexpected based on the disclosure of US 5,098,550. A one third faster filtration time when using the dewaxing aid of the present invention was not foreseeable based on US 5,098,550.

4. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

5. Further deponent saith not.

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Signature  
October 14<sup>th</sup> 2003  
\_\_\_\_\_  
Date